Docket No. 1422-0603P
(PATENT)

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

In Re Application of:	:	Confirmation No.: 1568
Yasuhiro YONEDA et al.	:	Group Art Unit: 1755
Serial No. 10/668,216	:	Examiner: MARCHESCHI,
Filed: September 24, 2003	:	Michael A.
For: POLISHING COMPOSITION		

DECLARATION UNDER 37 C.F.R. 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Yasuhiro YONEDA, residing at Wakayama-ken, Japan, hereby declare and state as follows:

1. That I am one of the co-inventors of U.S. Application Serial No. 10/668,216 filed on September 24, 2003. I am thoroughly familiar with the contents of said Application, its prosecution before the United States Patent and Trademark Office and the references cited therein.

2. That I am a graduate of Osaka University, Department of Engineering and received a master's degree in the year 1990, majoring in applied chemistry.

3. That I have been employed in Kao Corporation in the year 1990 and have been assigned to the Research Laboratories.

4. That I have been involved in the research and development of polishing composition since the year 1999.

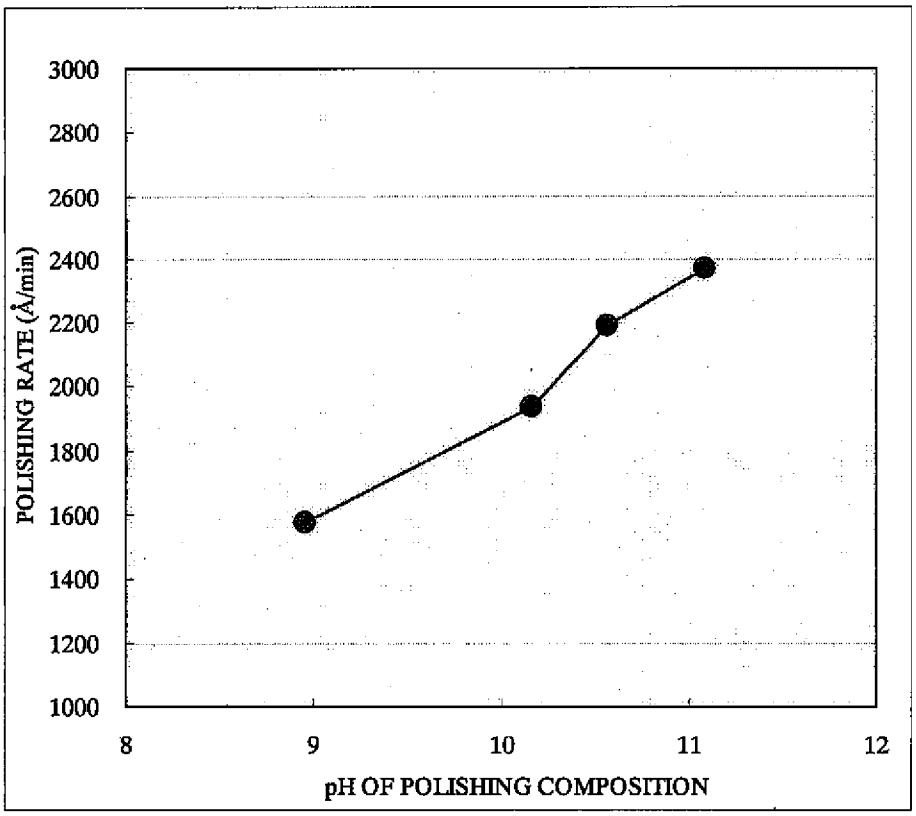
5. That the following experiments were conducted by myself or under my direct supervision and control in order to verify the technical significance by the difference of pH of the polishing composition in the present invention.

EXPERIMENTAL METHOD

I. Experiment on Effects to Polishing Rates by the Difference in pH

A polishing composition having a similar compositional condition to that of Example 5 of the present application was prepared so that the colloidal silica (average particle size (Di) = 80 nm) was contained in an amount of 13% by weight as inorganic particles, and polystyrene latex (average particle size (Dp) = 77 nm) was contained in an amount of 3% by weight. The pH of each of the polishing compositions was changed by varying amounts of potassium hydroxide used to obtain 4 kinds of samples having pHs at 8.96, 10.16, 10.57, and 11.09.

The polishing rate was determined in the same manner as in Examples of the present invention. The results are shown in the following figure.



As shown in Figure, high polishing rates are achieved in a pH range of from 10.5 to 12 as defined in the present invention.

II. pHs of Polishing Compositions of Examples and Comparative Examples of the Present Invention

Although each of the polishing compositions of Examples and Comparative Examples of the present invention did not explicitly show its pH, each of them is within the range of from 10.5 to 12 as defined in the present invention. The data for pHs for each of the polishing compositions of Tables 2, 3 and 4 in the present invention are shown as pH data inserts as Tables 2A, 3A and 4A.

Table 2A

	Inorganic Particles			Polymer Particles						
	Kind	Average Particle Size Di (nm)	Content (Effective Ingredient)	Kind	Average Particle Size Dp (nm)	Content (Effective Ingredient)	Di + 50 nm	Ratio of Contents (Cp/Ci)	Polishing Rate (nm/min)	pH
Ex. 1	(1)	11	20	**a**	40	3	61	0.15	130	10.8
Comp. Ex. 1	(1)	11	20	–	–	–	–	–	30	10.8
Ex. 2	(2)	26	13	**a**	40	3	76	0.23	350	10.9
Comp. Ex. 2	(2)	26	13	–	–	–	–	–	110	10.9
Ex. 3	(3)	45	13	**b**	54	3	95	0.23	390	10.8
Ex. 4	(3)	45	13	**f**	71	3	95	0.23	430	10.8
Comp. Ex. 3	(3)	45	13	–	–	–	–	–	180	10.9
Ex. 5	(4)	85	13	**c**	80	3	135	0.23	650	11.2
Comp. Ex. 4	(4)	85	13	–	–	–	–	–	210	11.2
Ex. 6	(5)	120	13	**e**	138	3	170	0.23	560	10.7
Comp. Ex. 5	(5)	120	13	–	–	–	–	–	90	10.7
Ex. 7	(5)	160	13	**e**	138	3	210	0.23	140	11.0
Comp. Ex. 6	(5)	160	13	–	–	–	–	–	70	11.0

Table 3A

	Inorganic Particles			Polymer Particles			Di + 50 nm	Determi-nation*	Ratio of Contents (Cp/Ci)	Polishing Rate (nm/min)	Ratio of Polishing Rate (**)	pH
	Kind	Average Particle Size Di (nm)	Content (Effective Ingredient)	Kind	Average Particle Size Dp (nm)	Content (Effective Ingredient)						
Ex. 2	(2)	26	13	**a**	40	3	76	Within range	0.23	350	3.2	10.9
Ex. 8	(2)	26	13	**b**	54	1	76	Within range	0.08	190	1.7	10.9
Comp. Ex. 7	(2)	26	13	**c**	80	1	76	Outside range	0.08	140	1.3	10.9
Comp. Ex. 2	(2)	26	13	–	–	–	–	–	–	110	1.0	10.9
Ex. 3	(3)	45	13	**b**	54	3	95	Within range	0.23	390	2.2	10.8
Ex. 9	(3)	45	13	**c**	80	0.5	95	Within range	0.04	320	1.8	10.9
Comp. Ex. 8	(3)	45	13	**d**	102	0.5	95	Outside range	0.04	180	1.0	10.9
Comp. Ex. 9	(3)	45	13	**e**	138	0.5	95	Outside range	0.04	200	1.1	10.9
Comp. Ex. 3	(3)	45	13	–	–	–	–	–	–	180	1.0	10.9
Ex. 10	(4)	85	13	**b**	54	5	135	Within range	0.38	360	1.7	11.1
Ex. 5	(4)	85	13	**c**	80	3	135	Within range	0.23	650	3.1	11.2
Ex. 11	(4)	85	13	**d**	102	3	135	Within range	0.23	600	2.9	11.2
Comp. Ex. 10	(4)	85	13	**e**	138	3	135	Outside range	0.23	130	0.6	11.1
Comp. Ex. 4	(4)	85	13	–	–	–	–	–	–	210	1.0	11.2

Note *: Determination was made as "within the range" for cases satisfying Dp ≤ Di + 50, and made as "outside the range" for other cases.
**: Ratio to the polishing rate with no polymer particles.

Table 4A

	Inorganic Particles			Polymer Particles			Di + 50 nm	Ratio of Contents (Cp/Ci)	Polishing Rate (nm/min)	Ratio of Polishing Rate (**)	pH
	Kind	Average Particle Size Di (nm)	Content (Effective Ingredient)	Kind	Average Particle Size Dp (nm)	Content (Effective Ingredient)					
Ex. 12	(4)	85	13	**b**	54	3	135	0.23	280	1.3	11.2
Ex. 10	(4)	85	13	**b**	54	5	135	0.38	360	1.7	11.1
Comp. Ex. 4	(4)	85	13	–	–	–	–	–	210	1.0	11.2
Ex. 13	(2)	26	13	**a**	40	1	76	0.08	250	2.3	10.7
Ex. 2	(2)	26	13	**a**	40	3	76	0.23	350	3.2	10.9
Ex. 14	(2)	26	13	**a**	40	7	76	0.54	380	3.5	10.6
Comp. Ex. 2	(2)	26	13	–	–	–	–	–	110	1.0	10.9
Ex. 15	(3)	45	13	**b**	54	1	95	0.08	270	1.5	10.9
Ex. 3	(3)	45	13	**b**	54	3	95	0.23	390	2.2	10.8
Ex. 16	(3)	45	13	**b**	54	5	95	0.38	490	2.7	10.8
Ex. 17	(3)	45	13	**b**	54	10	95	0.77	560	3.1	10.7
Comp. Ex. 3	(3)	45	13	–	–	–	–	–	180	1.0	10.9
Ex. 9	(3)	45	13	**c**	80	0.5	95	0.04	320	1.8	10.9
Ex. 18	(3)	45	13	**c**	80	1	95	0.08	270	1.5	10.9
Comp. Ex. 3	(3)	45	13	–	–	–	–	–	180	1.0	10.9

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	Inorganic Particles			Polymer Particles			Di + 50 nm	Ratio of Contents (Cp/Ci)	Polishing Rate (nm/min)	Ratio of Polishing Rate (**)	pH
	Kind	Average Particle Size Di (nm)	Content (Effective Ingredient)	Kind	Average Particle Size Di (nm)	Content (Effective Ingredient)					
Ex. 19	(4)	85	13	**d**	102	0.5	135	0.04	360	1.7	11.2
Ex. 20	(4)	85	13	**d**	102	1	135	0.08	490	2.3	11.2
Ex. 11	(4)	85	13	**d**	102	3	135	0.23	600	2.9	11.2
Comp. Ex. 4	(4)	85	13	–	–	–	–	–	210	1.0	11.2

Note: **: Ratio to the polishing rate with no polymer particles.

III. Discussion

It is clear from the tables that the desired effects cannot be exhibited in Comparative Examples where the relationship of the formula $Dp \leq Di + 50$ nm is not met even though the pH ranges are within 10.5 to 12.

On the other hand, it can be seen that the polishing rates are low in a case where pHs are less than 10.5 even if the relationship of the above formula is met.

According the description given in EP1036836, [0059], in a case where silica particles are used, a pH of from 2.5 to 10 is preferable, and a pH of from 2.5 to 8.5 is more preferable. From the description, the polishing compositions of a pH range of 10.5 to 12 of the present invention are never suggested thereby.

6. The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

7. Further declarant saith not.

Yasuhiro Yoneda

Yasuhiro YONEDA

July 26, 2007

Date